



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,826	11/12/2003	Frederik Bijkerk	FMW-GG-CIP	6924

7590

09/22/2006

HUDAK, SHUNK & FARINE CO. LPA
Daniel J. Hudak, Jr.
Suite 307
2020 Front Street
Cuyahoga Falls, OH 44221

EXAMINER

BLACKWELL RUDASIL, GWENDOLYN A

ART UNIT	PAPER NUMBER
----------	--------------

1775

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/706,826

Applicant(s)

BIJKERK ET AL.

Examiner

Gwendolyn Blackwell

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 34-42 is/are rejected.
- 7) ☒ Claim(s) 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/821,448.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/06</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1775

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 34-43 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent no. 6,449,086, Singh.

Regarding claim 34

Singh discloses a reflector stack used for multilayer mirrors for extreme ultraviolet radiation, (column 1, lines 5-10). The multilayer stack is comprised of alternating layers having different refractive indices with a capping layer formed thereon comprised of silicon nitride, (column 3, lines 3-55), meeting the limitations of claim 34.

Regarding claim 35

The alternating layers are comprised of Mo/Be or Mo/Si, (column 4, lines 26-28), meeting the limitations of claim 35.

Art Unit: 1775

4. Claims 34-38 are rejected under 35 U.S.C. 102(a) as being anticipated by International Application Publication no. WO 03/081187, WO '187.

Regarding claims 34-35

WO '187 disclose broadband mirrors for use in the extreme ultraviolet range, (page 1, 1st paragraph). The mirror is comprised of a multilayer system comprised of two alternating layers such as Mo/Si with a capping layer of silicon nitride, (pages 7-8, paragraphs 7-3), meeting the limitations of claims 34-35.

Regarding claims 36-38

Molybdenum carbide can be used as a barrier layer between the two alternating layers, (page 7, paragraph 4), meeting the limitations of claims 36-37.

Silicon carbide can also be used as a barrier layer, (page 7, paragraph 4), meeting the limitations of claim 38.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

Art Unit: 1775

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent no. 6,449,086, Singh.

Regarding claim 40

Singh discloses a reflector stack used for multilayer mirrors for extreme ultraviolet radiation, (column 1, lines 5-10). The multilayer stack is comprised of alternating layers having different refractive indices with a capping layer formed thereon, (column 3, lines 3-55). A layer (barrier) can be interposed between the alternating layers, (column 3, lines 10-20). Singh does not specifically disclose an example that the barrier layer comprises nitrogen.

Singh discloses that the materials used of the different layers in addition to being pure elements can also be made of nitrides. It would have been obvious to one skilled in the art at the time of invention to modify the barrier layer by making it a nitride as Singh discloses that the any of the layers can be a nitride layer, (column 4, lines 5-59), claim 40.

Regarding claim

Any or all of the layer can be implanted or diffused with other materials or elements, which would include nitrogen as the layer can be a nitride, (column 4, lines 55-67), claim 41.

The alternating layers are comprised of Mo/Be or Mo/Si, (column 4, lines 26-28), claim 42.

Art Unit: 1775

8. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over International Application Publication no. WO 03/081187, WO '187 in view of United States Patent no. 6,449,086, Singh.

WO '187 disclose broadband mirrors for use in the extreme ultraviolet range, (page 1, 1st paragraph). The mirror is comprised of a multilayer system comprised of two alternating layers such as Mo/Si with a capping layer of silicon nitride, (pages 7-8, paragraphs 7-3). Molybdenum carbide can be used as a barrier layer between the two alternating layers, (page 7, paragraph 4). WO '187 does not specifically disclose that the alternating layer can be Mo/Be.

Singh discloses a reflector stack used for multilayer mirrors for extreme ultraviolet radiation, (column 1, lines 5-10). The multilayer stack is comprised of alternating layers having different refractive indices with a capping layer formed thereon comprised of silicon nitride, (column 3, lines 3-55), wherein the alternating layers are comprised of Mo/Be or Mo/Si, (column 4, lines 26-28).

WO '187 and Singh disclose analogous inventions related to mirrors used in the extreme ultraviolet range. Singh disclose that it is well known to use Mo/Si and Mo/Be alternating layer systems in the extreme ultraviolet range mirrors. It would have been obvious to one skilled in the art at the time of invention to modify the Mo/Si system of WO '187 with the Mo/Be system of Singh as Singh discloses the two layer systems as being functional equivalents, (Singh, column 4, lines 27-28).

Allowable Subject Matter

9. Claim 43 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The closest prior art of record while teaching the broader claimed layer structure of independent claim 40 does not teach or suggest the combination wherein the barrier layer is a silicon nitride layer.

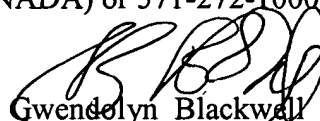
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn Blackwell whose telephone number is (571) 272-1533. The examiner can normally be reached on Monday - Thursday; 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1775

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Gwendolyn Blackwell
Examiner
Art Unit 1775

gab